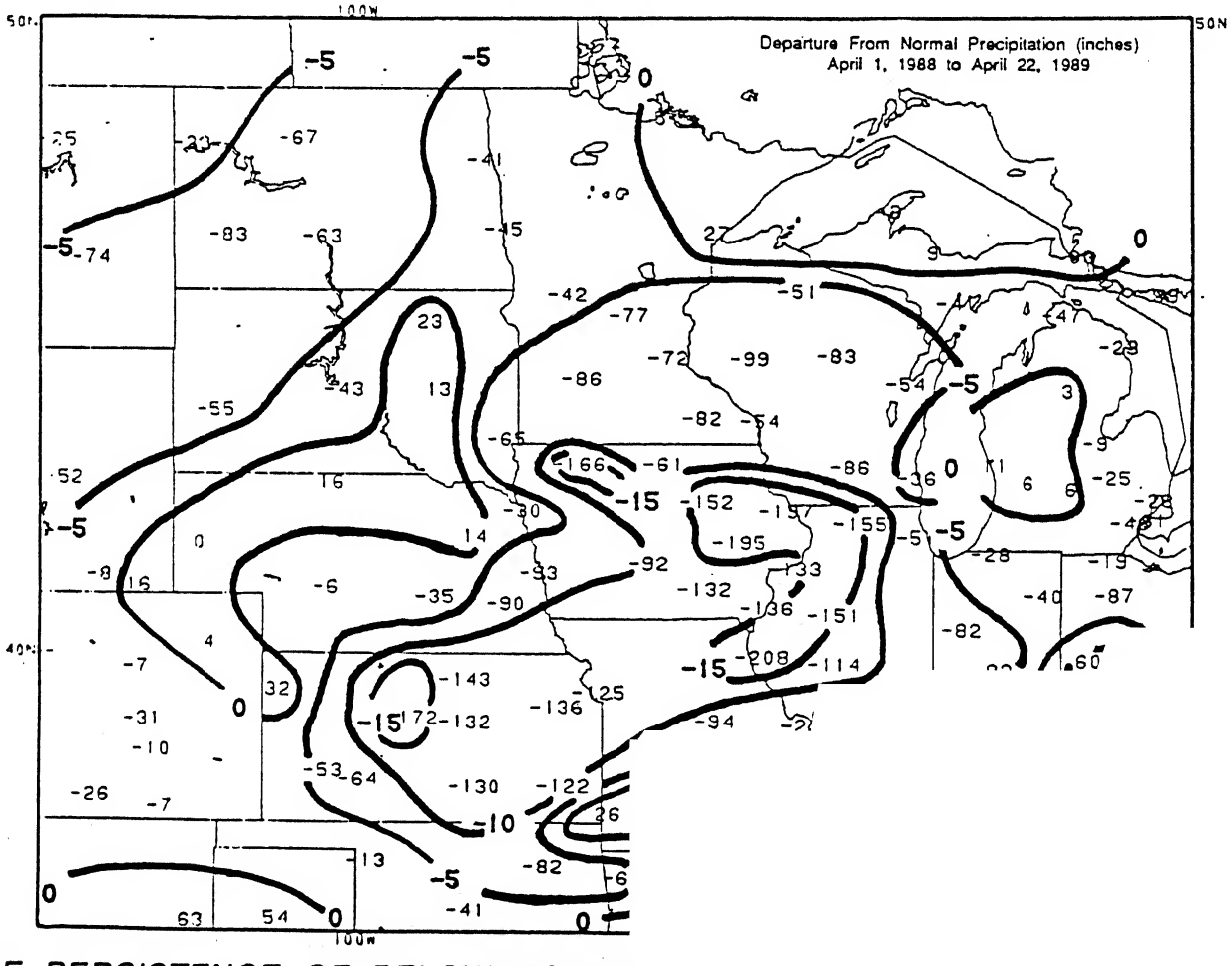
CLIMATE ANALYSIS CENTER

WEEKLY CLIMATE BULLETIN

No. 89/16 Washington, DC April 22, 1989



THE PERSISTENCE OF BELOW NORMA
SINCE THE BEGINNING OF LAST YEAR'S
CERN AS A NEW GROWING SEASON GI

UNITED STATES DEPART
NATIONAL OCEANIC AND ATMO
NATIONAL WEATHER SERVICE - NATI

WEEKLY CLIMATE BULLETIN

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This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief, concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- Highlights of major global climatic events and anomalies.
- U.S. climatic conditions for the previous week.
- U.S. apparent temperatures (summer) or wind chill (winter).
- Global two-week temperature anomalies.
- Global four-week precipitation anomalies.
- Global monthly temperature and precipitation anomalies.
- Global three-month precipitation anomalies (once a month).
- Global twelve-month precipitation anomalies (every 3 months).
- Global temperature anomalies for winter and summer seasons.
- Special climate summaries, explanations, etc. (as appropriate).

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Center via the Global Telecommunication System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

To receive copies of the Bulletin or change mailing address, write to:

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Attention: Weekly Climate Bulletin
NOAA, National Weather Service
Washington, DC 20233
Phone: (301) 763-8071

GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF APRIL 22, 1989

1. Coastal sections of British Columbia and Alaska:

MORE DRY WEATHER.

Most stations reported less than 12 mm of precipitation as very dry weather persisted [9 weeks].

2. Western United States:

UNUSUALLY WARM AGAIN.

Temperatures averaged up to 9°C above normal as unseasonably warm weather continued (see U. S. Weekly Climate Highlights) [9 weeks].

3. Central United States:

DRYNESS PERSISTS.

Little or no precipitation fell in most of the central United States; however, some stations in Iowa and Illinois observed up to 25 mm of rain (see U. S. Weekly Climate Highlights and Special Climate Summary) [5 weeks].

4. Southeastern United States:

TEMPERATURES MODERATE.

Near seasonal temperatures returned to the area (see U. S. Weekly Climate Highlights) [Ended at 2 weeks].

5. Uruguay and Eastern Argentina:

DRYNESS EASES.

As much as 142 mm of precipitation fell in northeaster Argentina where some stations experienced above norma precipitation for this time of year. To the south, other station measured less than 13 mm of rain. Long-term deficits ar significant as the dry season approaches [43 weeks].

6. Europe and the Middle East:

AREA STILL WARM.

Unusually warm weather prevailed as temperatures average as much as 12°C above normal [15 weeks].

7. Eastern Asia:

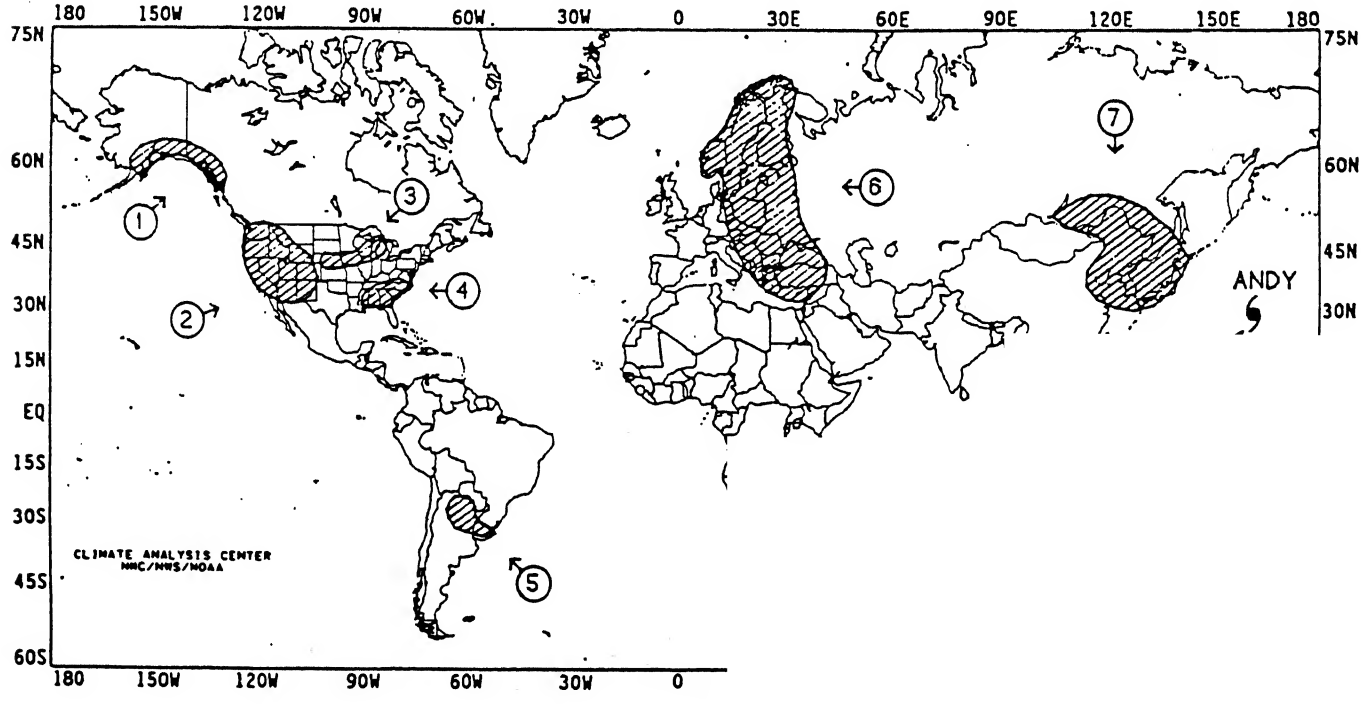
NEAR NORMAL IN SIBERIA; WARM ELSEWHERE.

After a prolonged spell of unusually mild weather temperatures were as much as 21°C below normal in part of Siberia [Ended at 27 weeks]. Abnormally high temperatures, reaching 6°C above normal, prevailed i Japan, Korea, and northeastern China [10 weeks].

8. Australia:

"BIG WET" REMAINS.

More heavy rains, up to 337 mm, fell at stations in easter Australia as unusually wet conditions persisted [6 weeks]



EXPLANAT

TEXT: Approximate duration of anomalies is in brackets. Pre week's values.

MAP: Approximate locations of major anomalies and episodic current two week temperature anomalies, four week precipitat

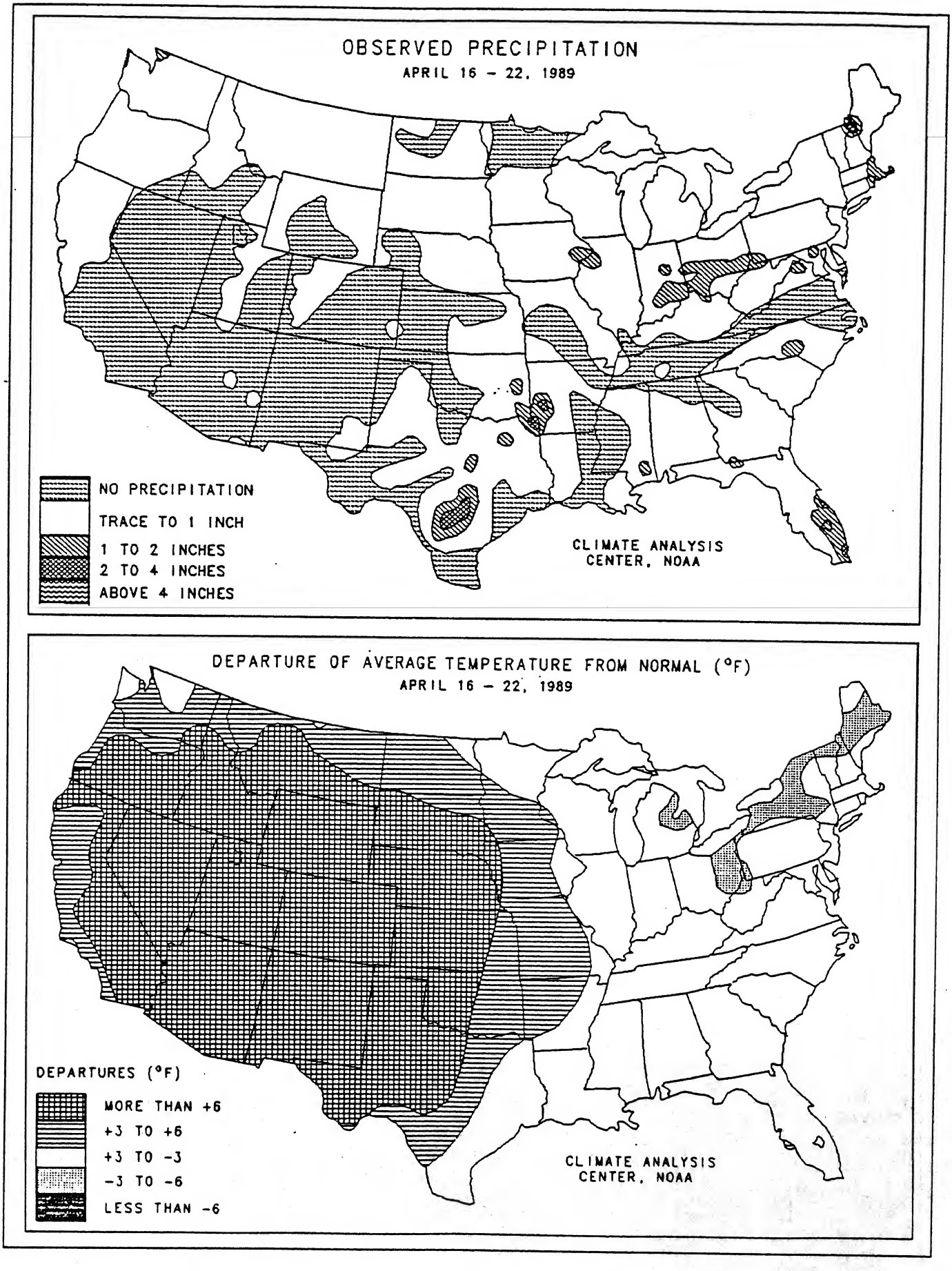
UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF APRIL 16 THROUGH APRIL 22, 1989.

Unseasonably warm weather continued to dominate the U.S. west of the Mississippi while chilly air settled into the Northeast. This colder air paid a brief visit to the northern Rockies, northern High Plains, and Great Plains early in the week behind a cold front that moved southeastward from Canada. A short-lived period of below-normal temperatures ensued, accompanied by scattered light rain and snow showers, before warm air returned to the region on Tuesday. The cold front, accompanied by numerous showers and thunderstorms, rapidly moved across the Great Lakes, Ohio and Tennessee Valleys, and the Northeast before stalling and washing out across the South Atlantic and Gulf Coast States on Wednesday. Dry air in upper levels of the atmosphere prevented excessive amounts of precipitation, but damaging winds and large hail accompanied light to moderate rainfall in scattered regions from central Texas through the Mississippi, Ohio, and Tennessee Valleys to the Middle and South Atlantic Coast. Farther west, a Pacific storm brought cool, damp weather to the Pacific Northwest and northern California on Thursday and Friday, breaking up and otherwise warm and dry week. Late in the week, the warm air in the western U.S. collided with cooler air to the east, touching off isolated severe thunderstorms in the Great Plains. Dryness in the upper atmosphere again limited rainfall amounts, but several reports of severe weather were received. Large hail pelted parts of Oklahoma, Kansas, and Minnesota (covering the ground in a small part of north-central Oklahoma) while near hurricane-force winds damaged several structures in southeastern Montana. Cooler and drier conditions helped alleviate flooding along the Red River Valley while moist, tropical air provided Florida with scattered showers and thundershowers all week. This precipitation slightly eased long-term moisture deficits, especially in eastern Florida, but more rain is needed to alleviate the dryness in southern sections of the state.

Data from the River Forecast Centers depicted a very dry week across most of the Nation. Up to 3.5 inches of rain fell in parts of eastern Florida, while scattered reports of 2 to 3 inches were received from central Texas to southern Missouri. Just over 2 inches of rain fell in isolated locations across the Ohio Valley, coastal New England, and the Pacific Northwest, while reports of 1 or 2 inches were common from eastern Iowa to the central Appalachians (see Table 1). Between 1 and 2 inches also fell in central and east-central sections of the Carolinas and along the Oregon Coast. The precipitation from Iowa eastward was quite timely as the growing season begins with large accumulated precipitation deficits, but long-term dryness still plagues eastern Iowa and adjacent portions of the Corn Belt (see Special Climate Summary).

Excessive heat dominated the western U.S. for the third consecutive week, with the greatest positive departures (between +10°F and +16°F) occurring in the central and southern Intermountain region, the central and southern Rockies, the central High Plains and the west-central Great Plains (see Table 2). More than 65 daily record high temperatures were set or tied, and several stations in the Desert Southwest and western Great Plains reported temperatures of over 100°F at least once (see Figure 1). Tucson, AZ recorded its earliest 100°F reading ever on April 20. Farther north, Alaska remained rather mild and tranquil, although the excessive positive departures of the previous week did not recur. In the eastern U.S., The Great Lakes and Southeast regions experienced near normal temperatures while fair and chilly weather dominated the Northeast. Average temperatures as much as 5°F below normal were observed in western New York State, and departures of -3°F to -4°F were common in northern West Virginia, western Pennsylvania, northeastern Michigan and coastal New England (see Table 3).


OBSERVED PRECIPITATION
APRIL 16 - 22, 1989
NO PRECIPITATION
TRACE TO 1 INCH
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CENTER, NOAA
DEPARTURE OF AVERAGE TEMPERATURE FROM NORMAL (°F)
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DEPARTURES (°F)
MORE THAN +6
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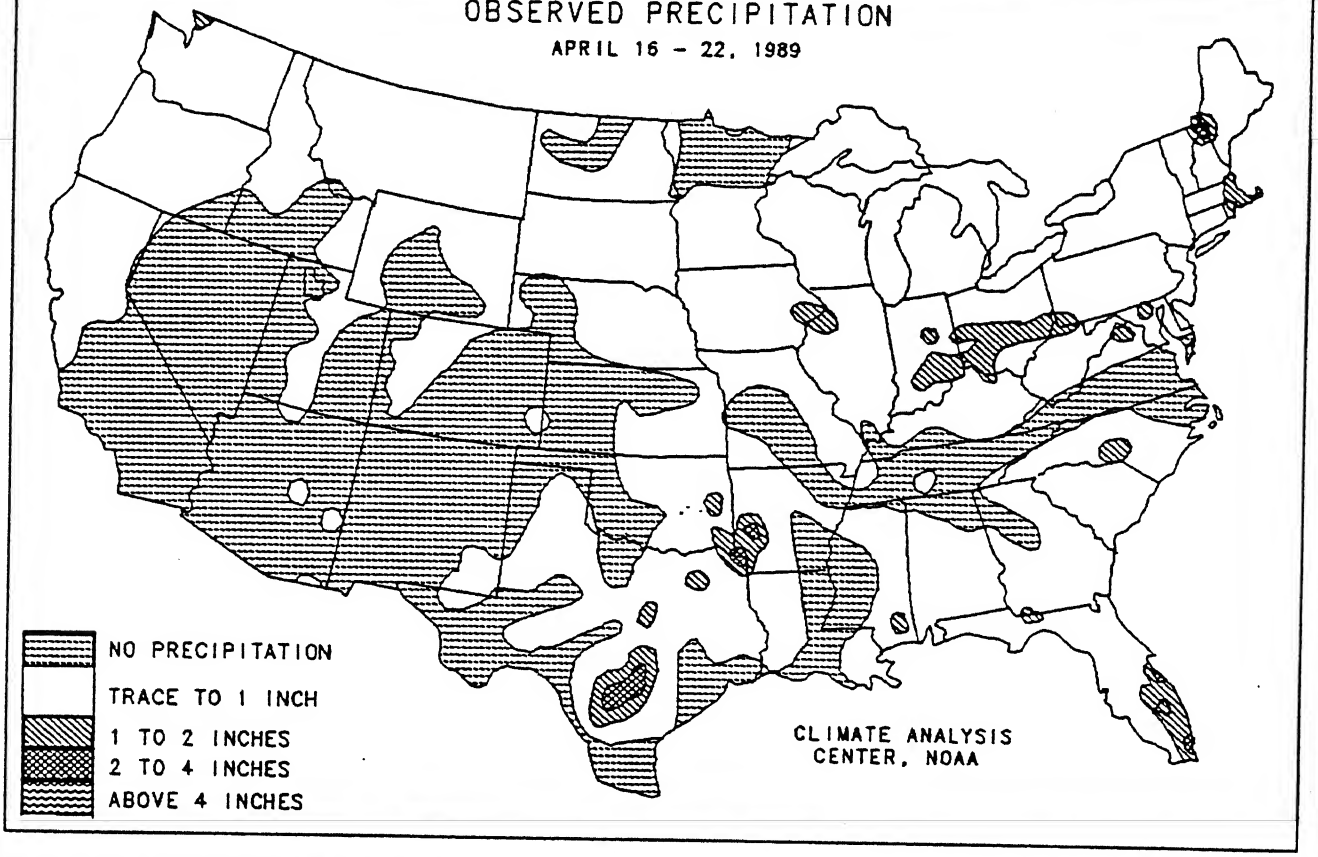
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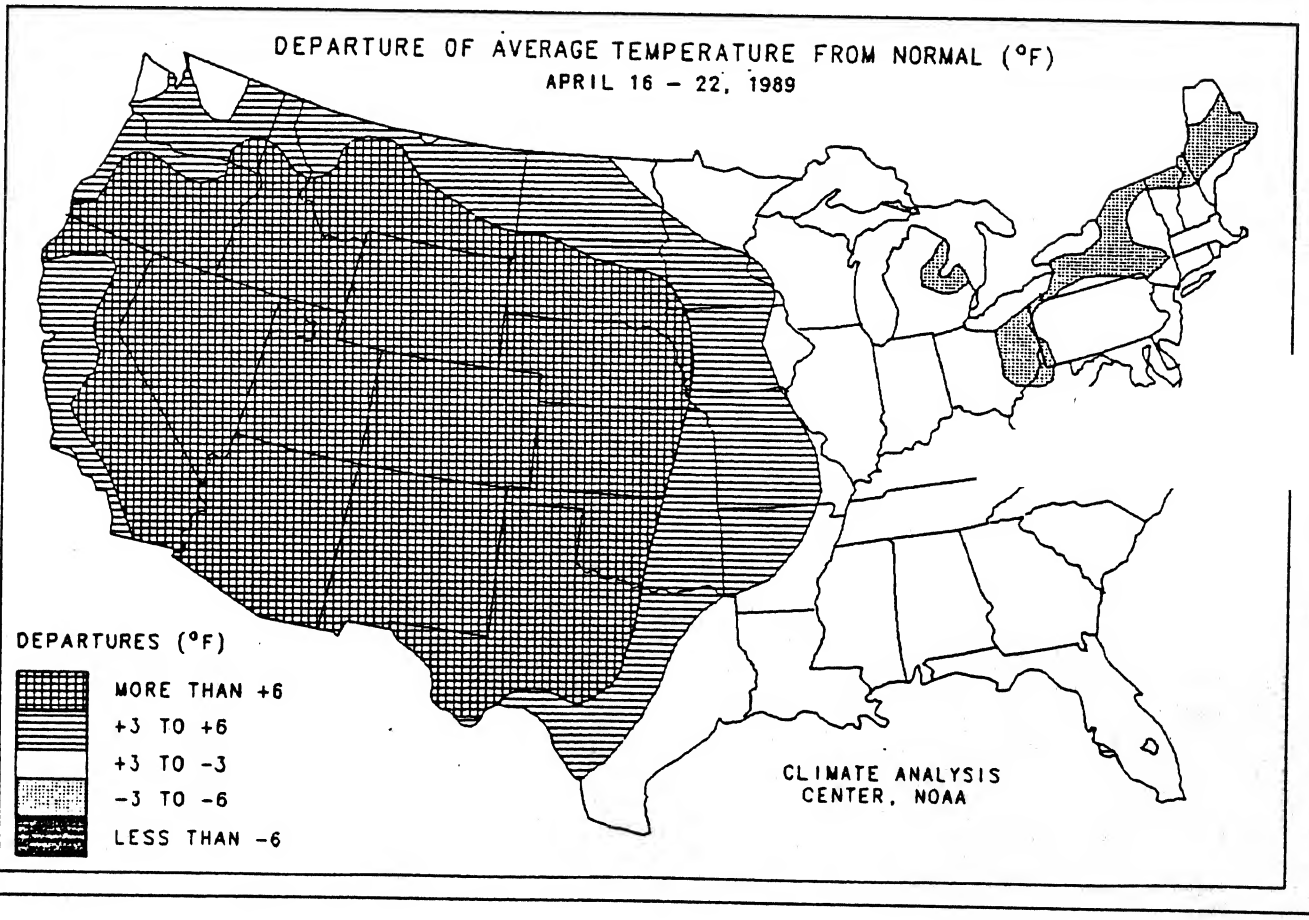
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DEPARTURES (°F)
MORE THAN +6
+3 TO +6
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LESS THAN -6
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TABLE 1. Selected stations with more than 1.50 inches of precipitation for the week.

Station	Total(In)	Station	Total(In)
Hilo/Lyman, HI	4.39	Chatham, MA	1.94
Homestead AFB, FL	2.64	West Palm Beach, FL	1.89
Kelly AFB, TX	2.57	Tallahassee, FL	1.80
Mt. Washington, NH	2.48	Bergstrom AFB, FL	1.57
Randolph AFB, TX	2.17		

TABLE 2. Selected stations with temperatures averaging 12.0°F or more ABOVE normal for the week.

	Degrees F			Degrees F	
Station	Dep.	Avg.	Station	Dep.	Avg.
Phoenix, AZ	+16.2	85.1	Deming, NM	+13.2	72.3
Ely, NV	+16.1	58.0	Sidney, NE	+13.1	58.9
Cedar City, UT	+16.0	63.9	Colorado Springs, CO	+13.0	60.1
Las Vegas, NV	+15.6	80.1	Albuquerque, NM	+12.7	68.9
Rock Springs, WY	+15.6	56.6	Idaho Falls, ID	+12.7	57.1
Prescott, AZ	+15.2	65.5	Casper, WY	+12.7	56.0
Grand Junction, CO	+14.9	67.5	Cheyenne, WY	+12.7	55.6
Lander, WY	+14.8	58.3	Delta, UT	+12.6	63.2
Akron, CO	+14.6	61.9	Roswell, NM	+12.4	73.6
Salt Lake City, UT	+14.5	64.4	Goodland, KS	+12.4	62.6
Denver, CO	+14.5	62.9	Burley, ID	+12.3	59.0
Tucson, AZ	+13.9	79.8	Pocatello, ID	+12.3	58.0
Hill AFB, UT	+13.9	64.7	Laramie, WY	+12.2	50.6
Kotzebue, AK	+13.9	28.4	Yuma, AZ	+12.1	83.6
Davis-Monthan AFB, AZ	+13.7	79.1	Trinidad, CO	+12.1	62.7
Luke AFB, AZ	+13.6	81.9	Lubbock, TX	+12.0	73.4

TABLE 3. Selected stations with temperatures averaging 3.0°F or more BELOW normal for the week.

	Degrees F			Degrees F	
Station	Dep.	Avg.	Station	Dep.	Avg.
Griffis AFB, NY	-5.5	42.2	Utica, NY	-3.6	42.6
Rochester, NY	-5.0	42.6	Youngstown, OH	-3.6	45.3
Saginaw, MI	-4.6	42.9	Poughkeepsie, NY	-3.5	45.9
Mt. Washington, NH	-4.5	19.5	Morgantown, WV	-3.5	50.1
Massena, NY	-4.5	40.0	Erie, PA	-3.4	43.5
Buffalo, NY	-4.0	42.7	Cleveland, OH	-3.2	46.5
Boston, MA	-4.0	45.6	Sault Ste. Marie, MI	-3.1	36.7
Parkersburg, WV	-3.9	51.5	Wilkes-Barre, PA	-3.1	46.7
Syracuse, NY	-3.7	43.8	Elkins, WV	-3.1	48.5

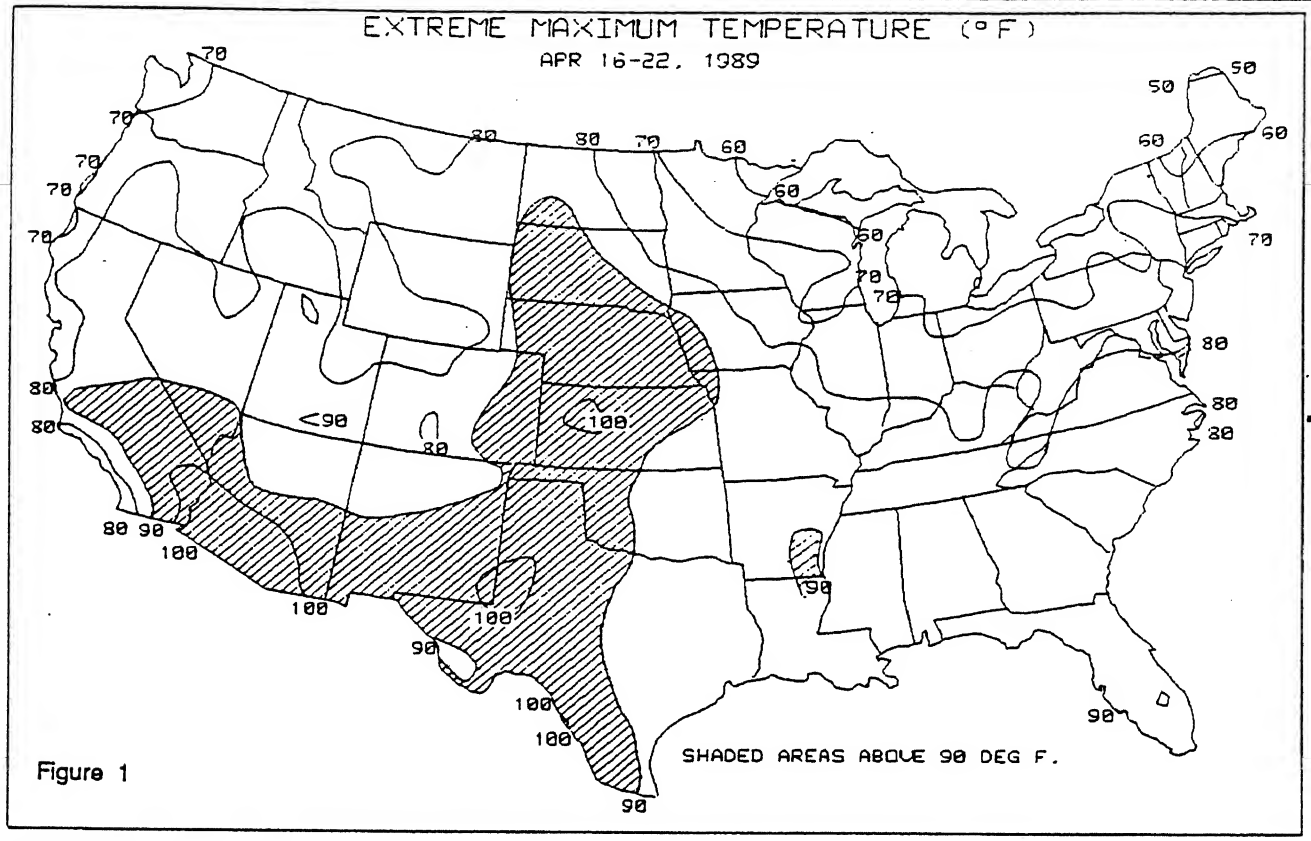
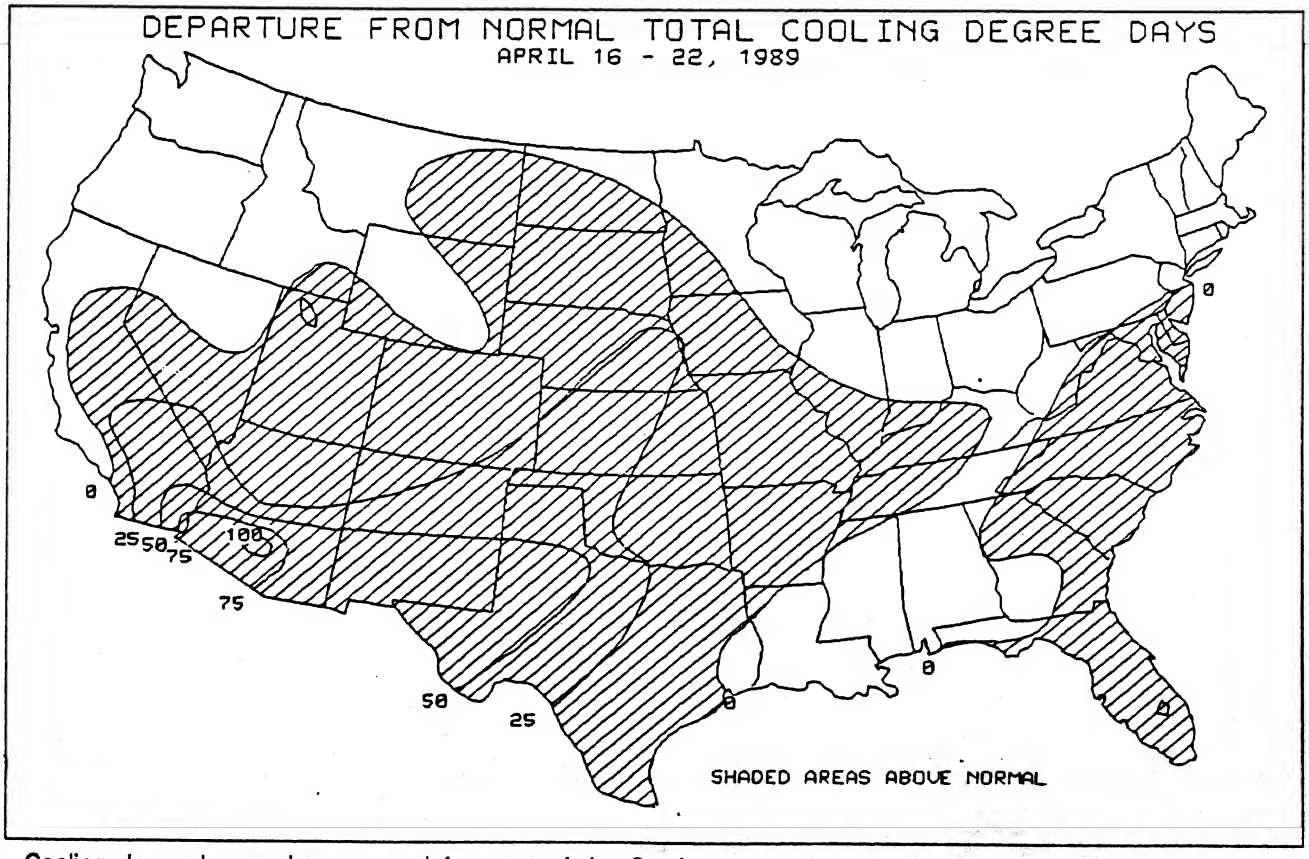
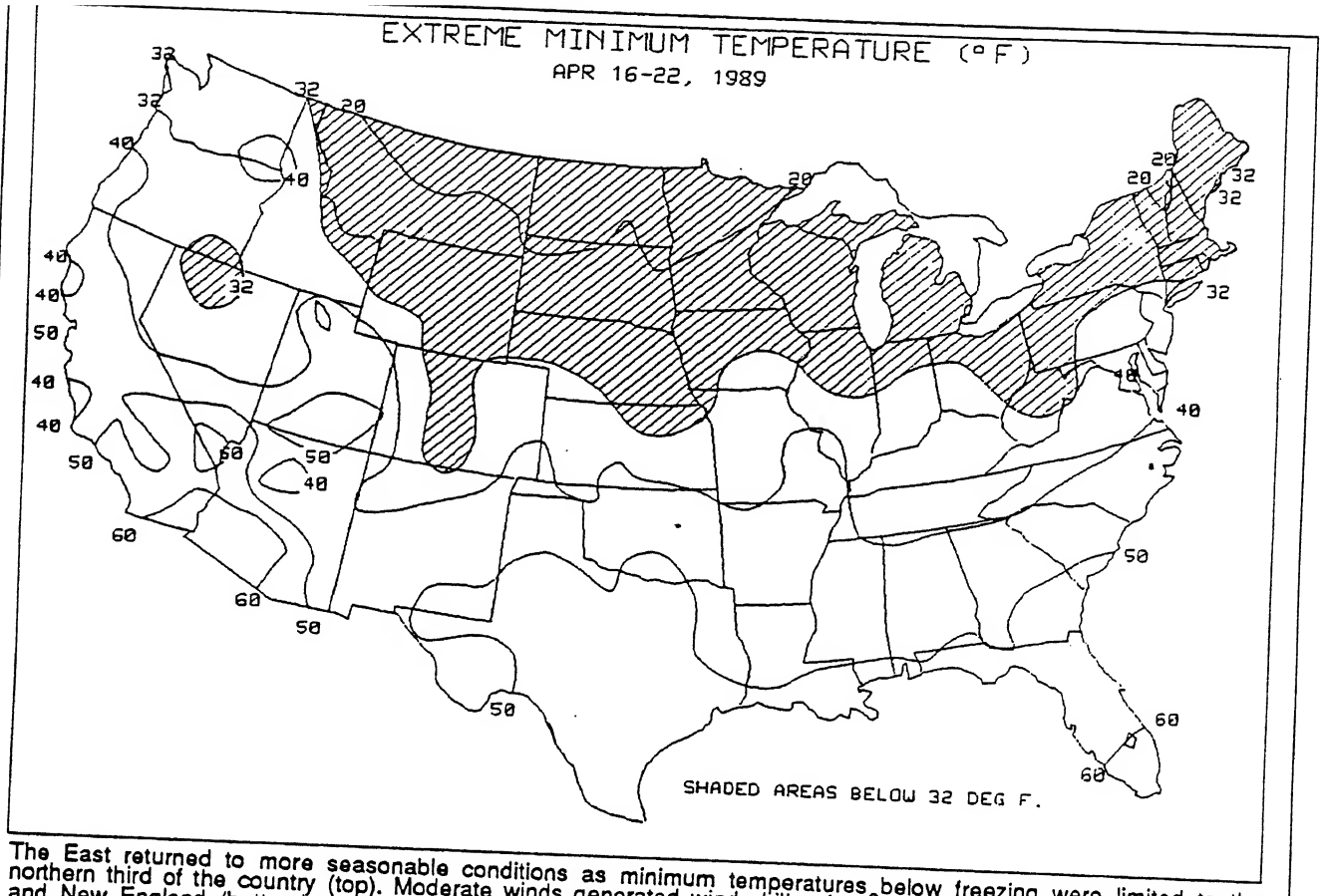


Figure 1

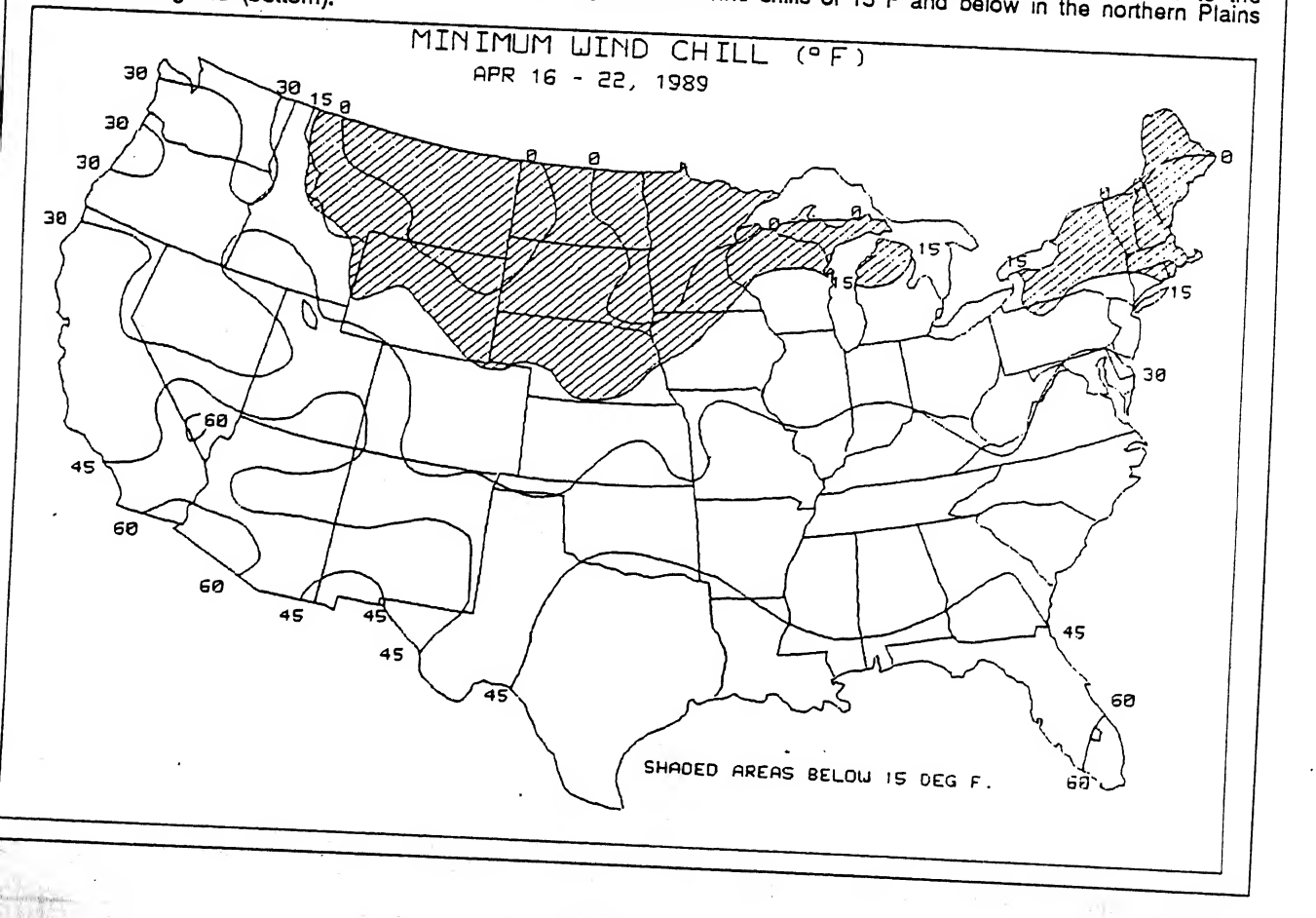
Record breaking 90's pushed into the northern Plains as high temperatures continue to bake the Southwest.

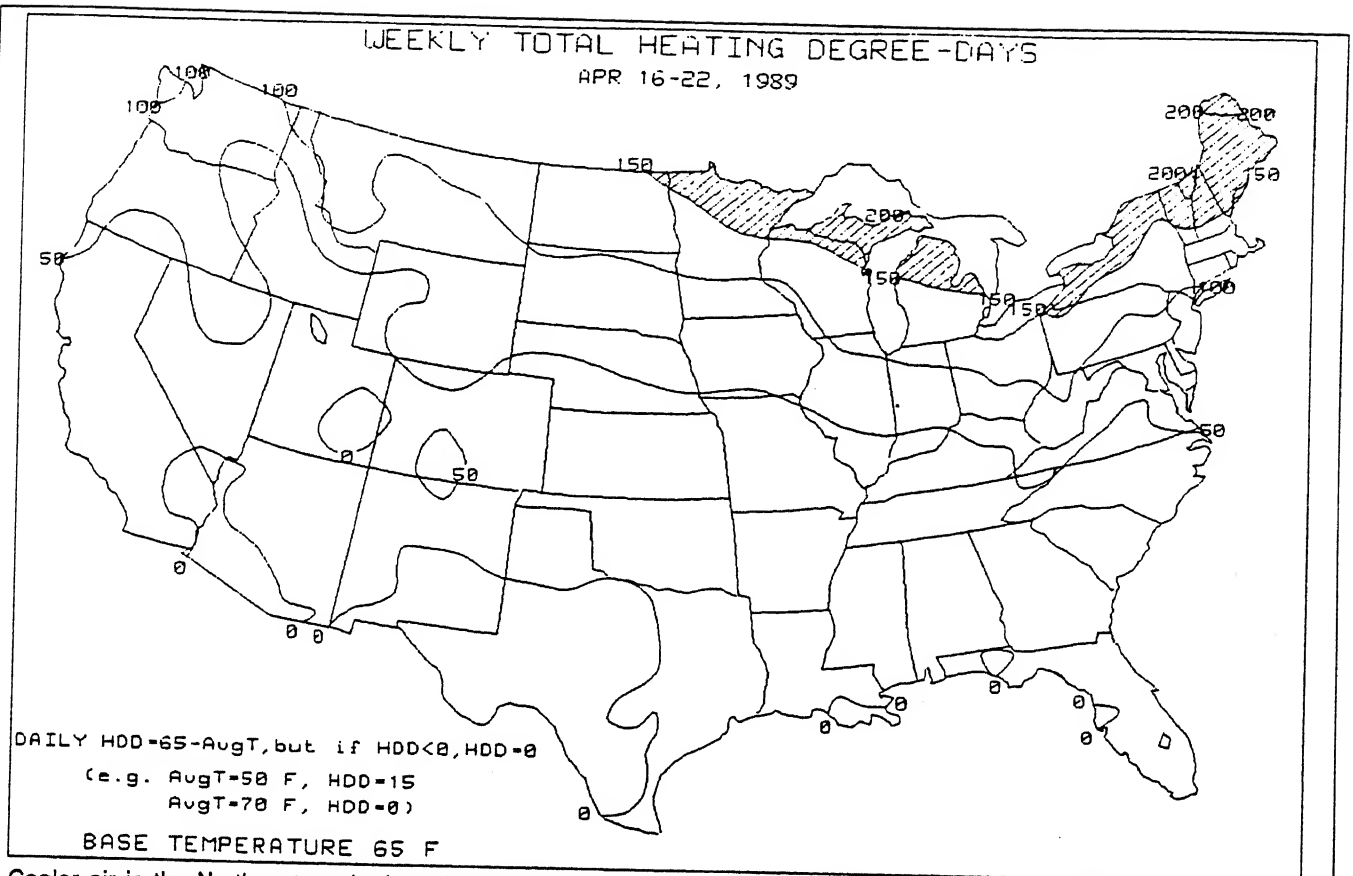


Cooling demand was above normal for most of the Southwest, southern Plains, and southern East Coast.

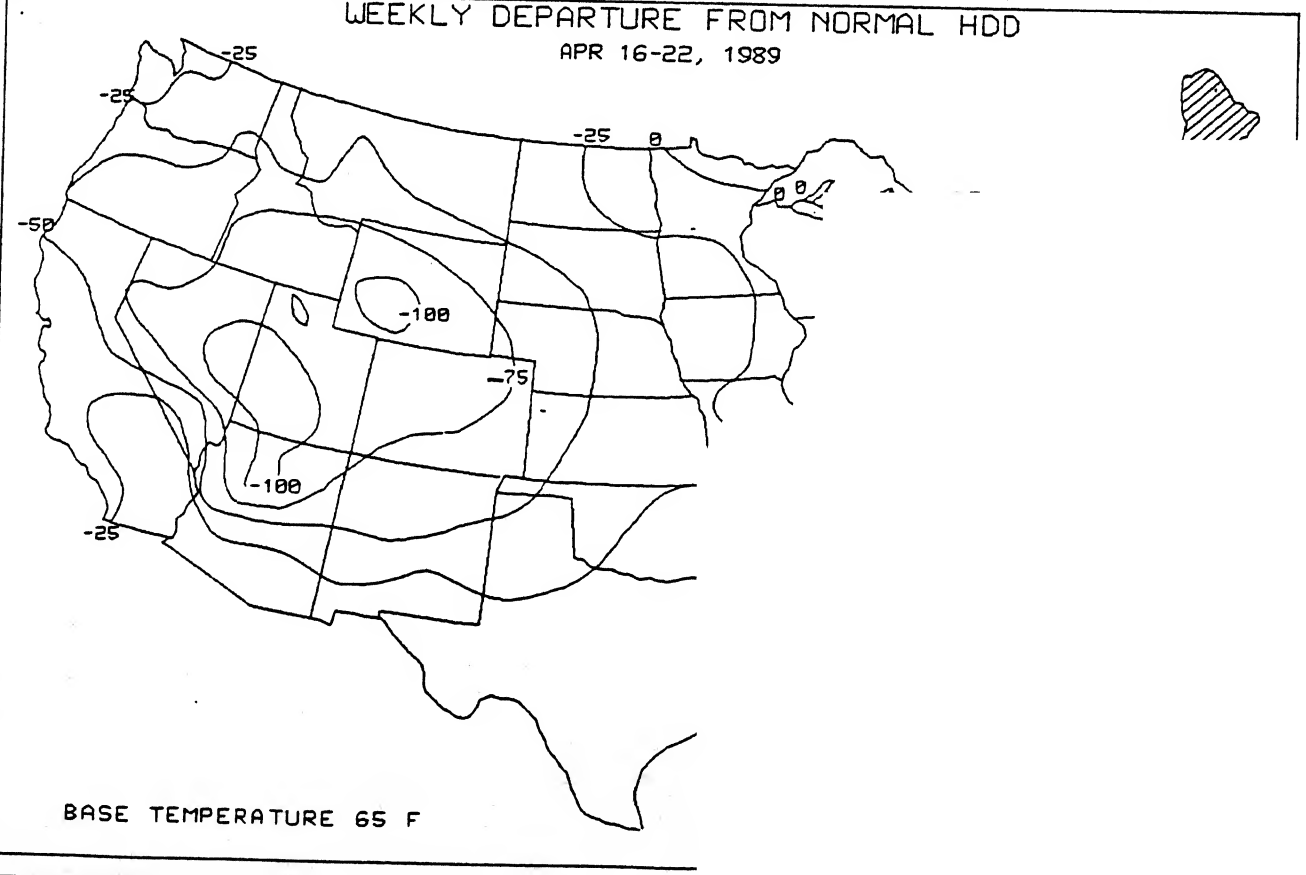


The East returned to more seasonable conditions as minimum temperatures below freezing were limited to the northern third of the country (top). Moderate winds generated wind chills of 15°F and below in the northern Plains and New England (bottom).





Cooler air in the Northeast pushed weekly heating usage to over 150 HDDs (top) while continued high temperatures in the Southwest sent heating demands as much as 100 HDDs below normal (bottom).



EXPLANATION OF CLIMATE ANOMALY DEPICTION CHARTS
Climate Analysis Center, National Weather Service, NOAA

A. Four-Week Precipitation Anomalies:

The shaded areas depict regions where precipitation amounts for the four weeks ending on the indicated date are such that, when compared with the historical climatic record, they fall either within approximately the lowest ten percent or the highest ten percent of the smoothed historical distribution of precipitation amounts for the same calendar time period. One exception is made to this general procedure: In areas where the normal (mean) amount of precipitation for the four-week calendar period is less than 20 mm, anomalies are not depicted unless the currently reported amount of precipitation exceeds 50 mm. This exception prevents normally arid or seasonally dry regions from being depicted as anomalously dry on the chart; it also prevents wet anomalies from being depicted in such regions unless the amount of precipitation received is truly substantial.

A four week period is used for the determination of these depicted "short-term" anomalies because that is about the minimum length of time that a marked dry anomaly must exist in order for it to have a significant socio-economic impact. (Other charts are prepared that show three, six, and twelve-month "long-term" precipitation anomalies in a similar manner.)

The anomalies shown on the chart are based on approximately 2500 observing stations for which precipitation reports are sufficiently complete for the period. A small number of observations are allowed to be missing or are estimated conservatively based on partial reports. Because of this, a dry bias may exist for some stations used in the analysis. As a result, the extent of dry anomalies may sometimes be overestimated and wet ones underestimated. Additionally, there are insufficient reports from some regions for determining the magnitudes of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. No attempt is made to depict anomalies in such regions.

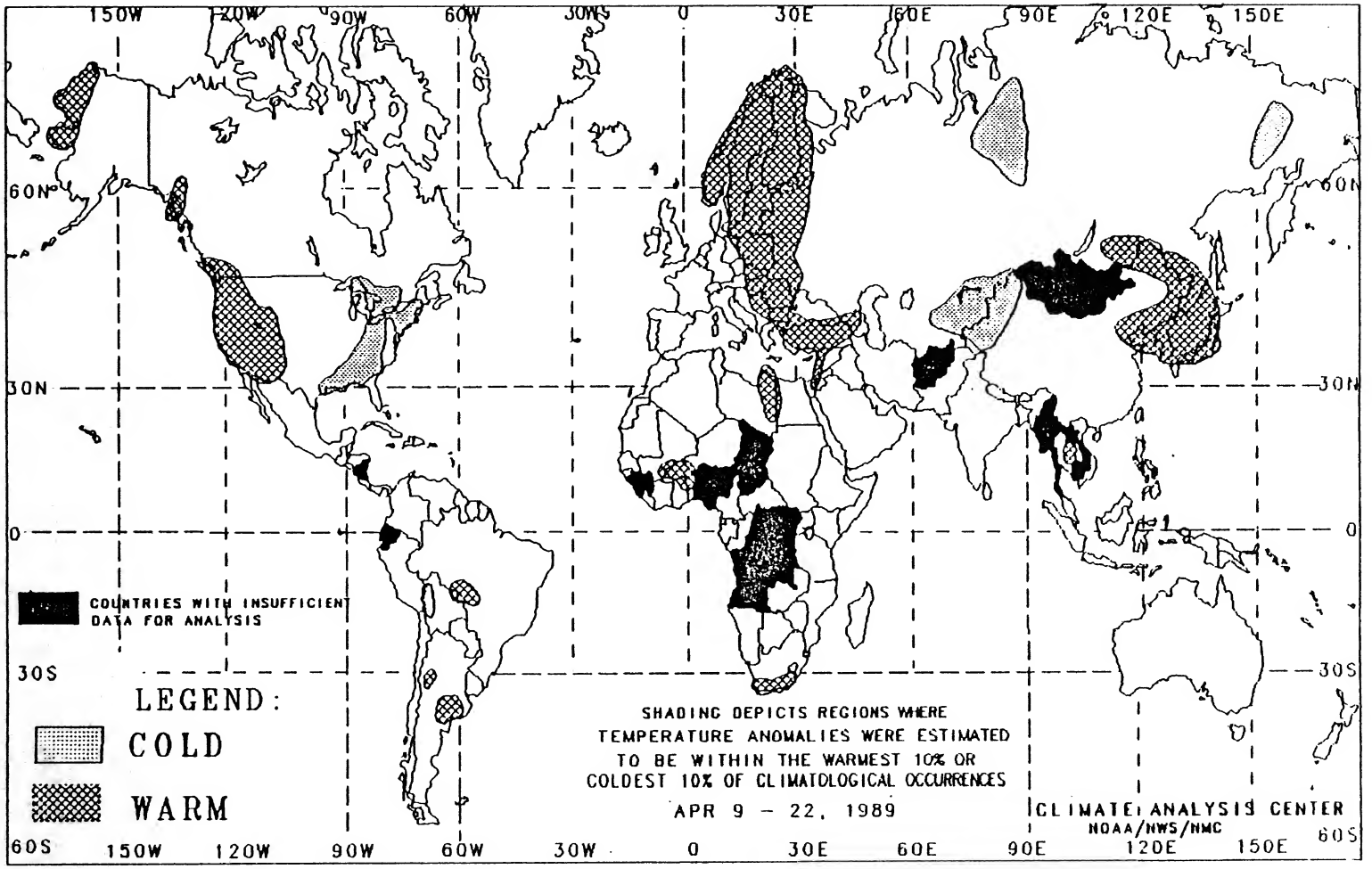
The chart shows general areas of four-week precipitation anomalies. Caution must be used in relating depicted anomalies to local conditions, especially in mountainous regions.

B. Two-Week Temperature Anomalies:

The shaded areas depict regions where the mean temperature for the two-week period ending on the indicated date departed from the normal mean temperature for the period by enough to place the departure in either the warmest 10 percent or coldest 10 percent of occurrences as determined from the smoothed climatological distribution. A two-week period is used because this period is short enough to capture major temperature excursions associated with movements of the major planetary waves of the general circulation, yet long enough to avoid the undue influence of temperature changes associated with relatively minor traveling disturbances. (Charts showing temperature anomalies for longer time periods are also prepared.) Temperature anomalies are never depicted if the departure of the temperature from normal is less than 1.5 C, since smaller departures are sensitive to data errors and are usually of small economic importance. A small number of temperature observations at a station are allowed to be missing or are estimated. These may result in either warm or cold bias at some locations. In other respects, the discussion of precipitation anomalies applies equally to temperature anomalies.

GLOBAL TEMPERATURE ANOMALIES

2 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

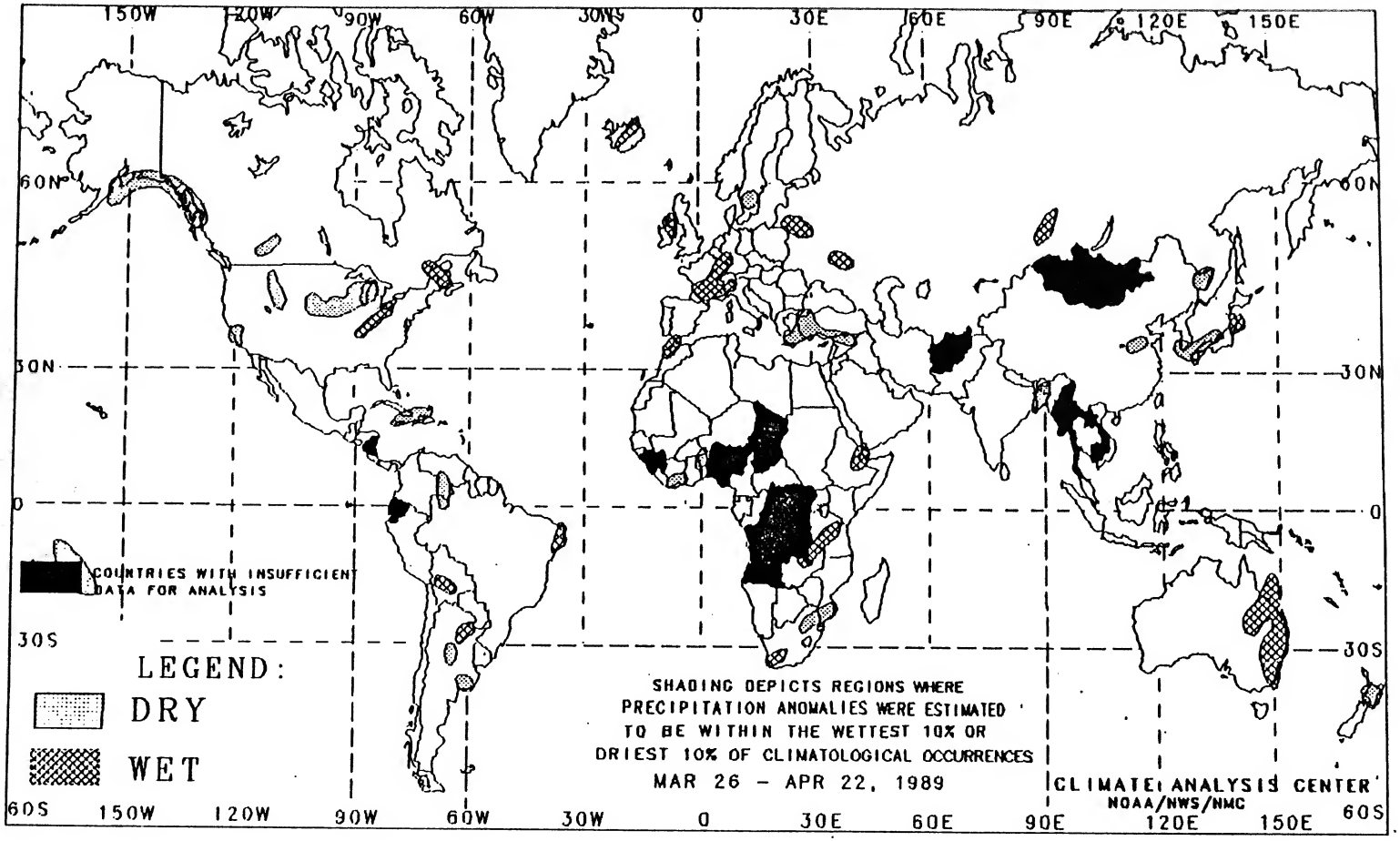
Temperature anomalies are not depicted unless the magnitute of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

This chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL PRECIPITATION ANOMALIES

4 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were recieved or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South Africa, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data are insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week predipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

SPECIAL CLIMATE SUMMARY

LONG-TERM PRECIPITATION DEFICITS CONTINUE AS GROWING SEASON COMMENCES.

Dryness in the Midwest first became a concern during the beginning of last year's growing season. The map below depicts the percentage of normal precipitation between April 1 and June 30, 1988. This was the driest 3-month period during the "Drought of 1988" in most of the central U.S. Stippled areas received less than 50% of normal precipitation. This included a large portion of the Mississippi Valley and Corn Belt region, as well as parts of the Great Lakes and northern Midwest. Less than 25% of normal precipitation fell on parts of southeastern Iowa and western Illinois.

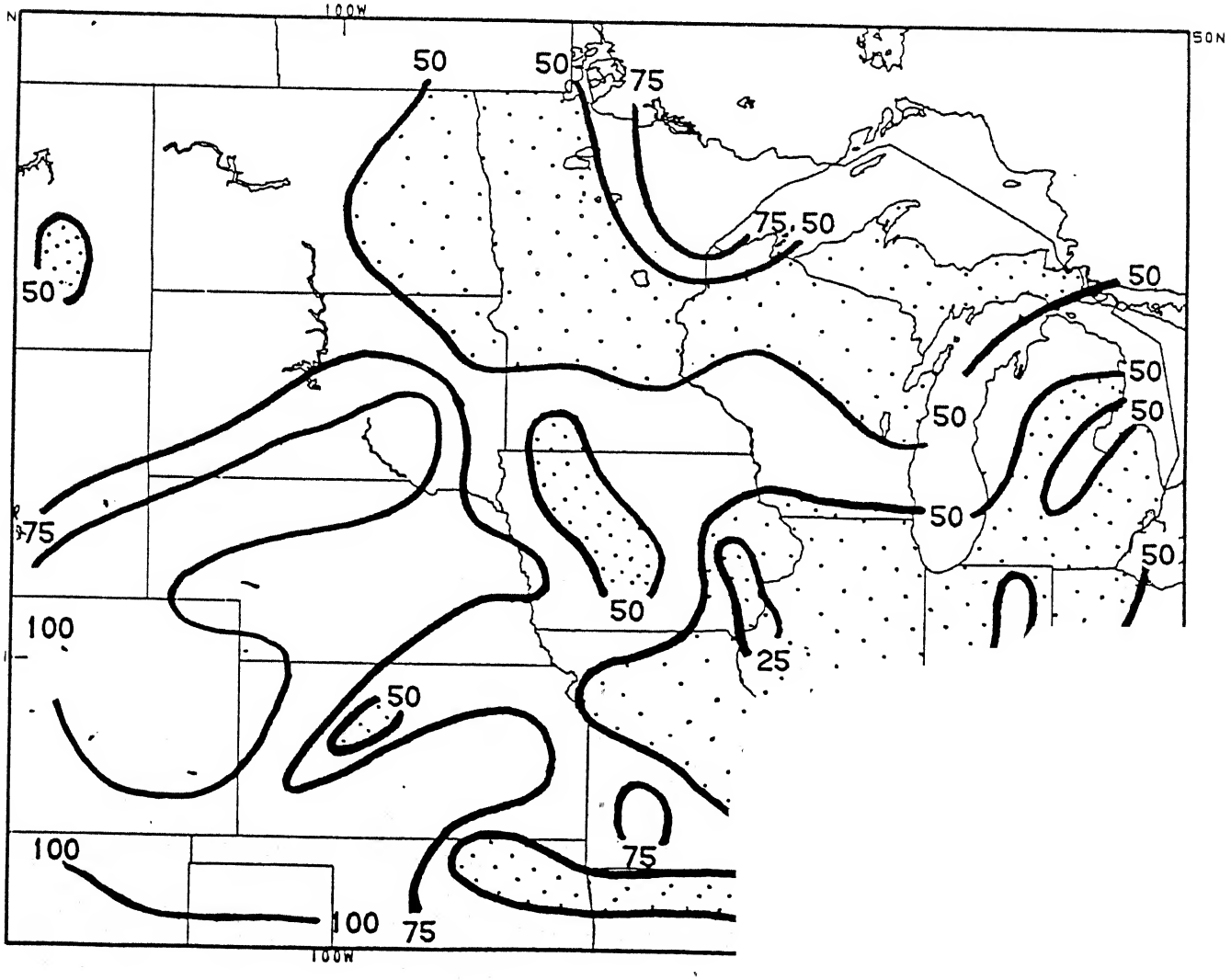


Figure 1. Midwest percent of normal precipitation for the period Apri
areas received less than 50% of normal precipitation.

In late summer and fall of last year, precipitation fell in more typical amounts. The map below depicts the percentage of normal precipitation between July 1 and November 30, 1988. Stippled areas received less than 50% of normal precipitation, and were confined to central Kansas and portions of west central North Dakota. A few sections of the Mississippi Valley received less than 75% of normal precipitation, but most of the previously dry areas received near normal to above normal precipitation. Amounts in excess of 150% fell on parts of the Great Lakes States and the Ohio and Tennessee Valleys.

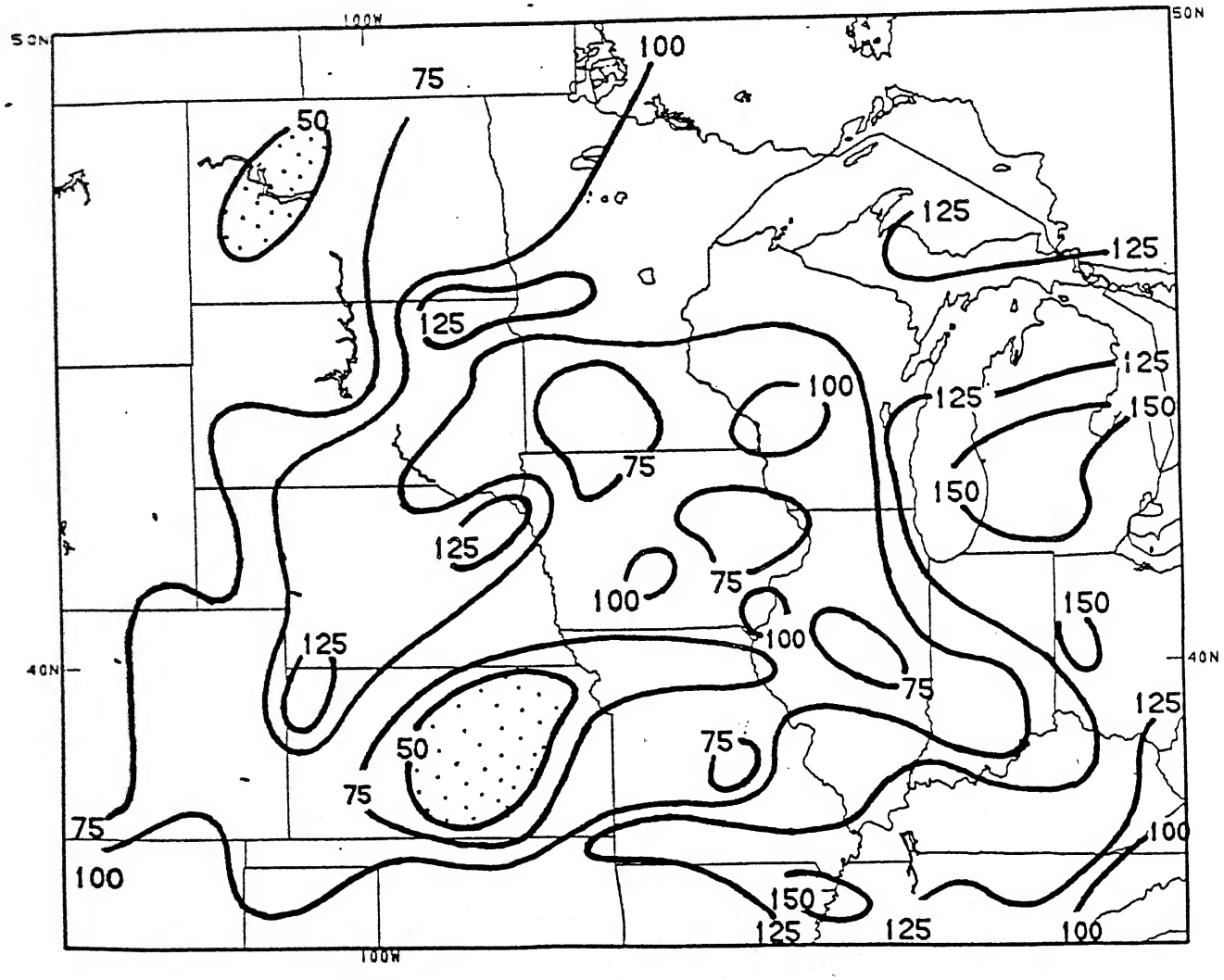


Figure 2. Midwest percent of normal precipitation for the period July 1, 1988 through November 30, 1988. Stippled areas received less than 50% of normal precipitation.

Although much of the Lower Mississippi, Ohio, and Tennessee Valleys have continued to receive above-normal precipitation, some dryness has redeveloped across the Great Plains, upper Mississippi Valley, and southern Great Lakes regions. This includes a good portion of the Wheat and Corn Belt areas. The map below depicts the percentage of normal precipitation between December 1, 1988 and April 22, 1989. Stippled areas received less than 50% of normal precipitation. The driest areas include western, southern, and eastern Iowa, southeastern Nebraska, and central Kansas, as well as northeastern New Mexico. In addition, a large swath of land from southwest to northeast across the map received less than 75% of normal precipitation. At the same time, above normal precipitation continued across southeastern portions of the Midwest, where long-term dryness has ceased to be a concern.

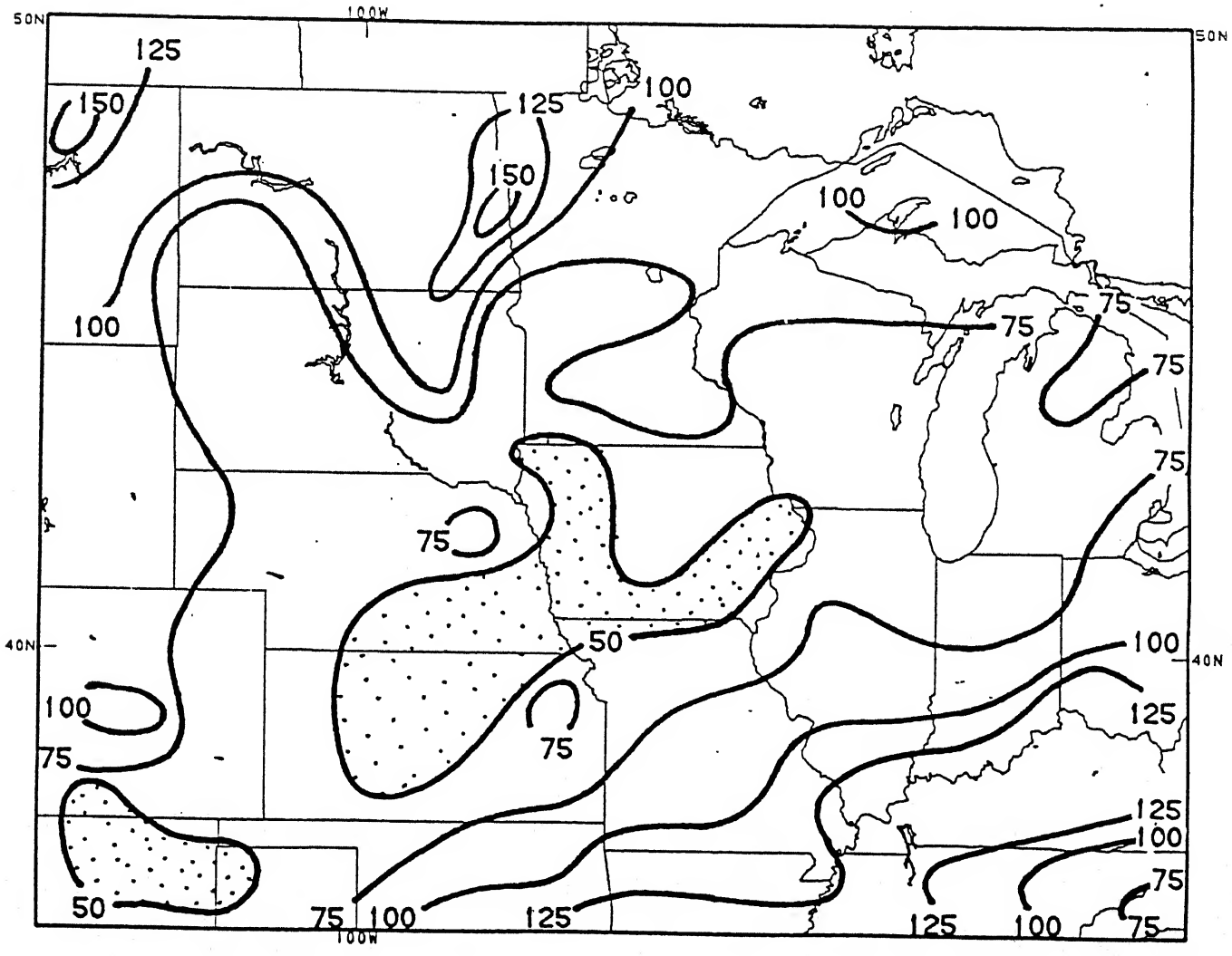


Figure 3. Midwest percent of normal precipitation for the period December 1, 1988 through April 22, 1989. Stippled areas received less than 50% of normal precipitation.

This final map summarizes the previous three, depicting the percentage of normal precipitation from April 1, 1988 through April 22, 1989 (the same time period as the map on the front cover). Stippled areas received less than 75% of normal precipitation. The precipitation deficits created by the "Drought of 1988" have been more than alleviated in most portions of the Tennessee, lower Ohio, and middle Mississippi Valleys; in fact, flooding has become a problem along the Red River in North Dakota and along several rivers in the Tennessee Valley. At the same time, long-term precipitation deficits have continued or slightly increased across much of the Upper Mississippi Valley, the northern and south central Great Plains, and the northern High Plains. The Climate Analysis Center will continue to monitor the this situation closely, and will issue more Special Climate Summaries as conditions warrant.

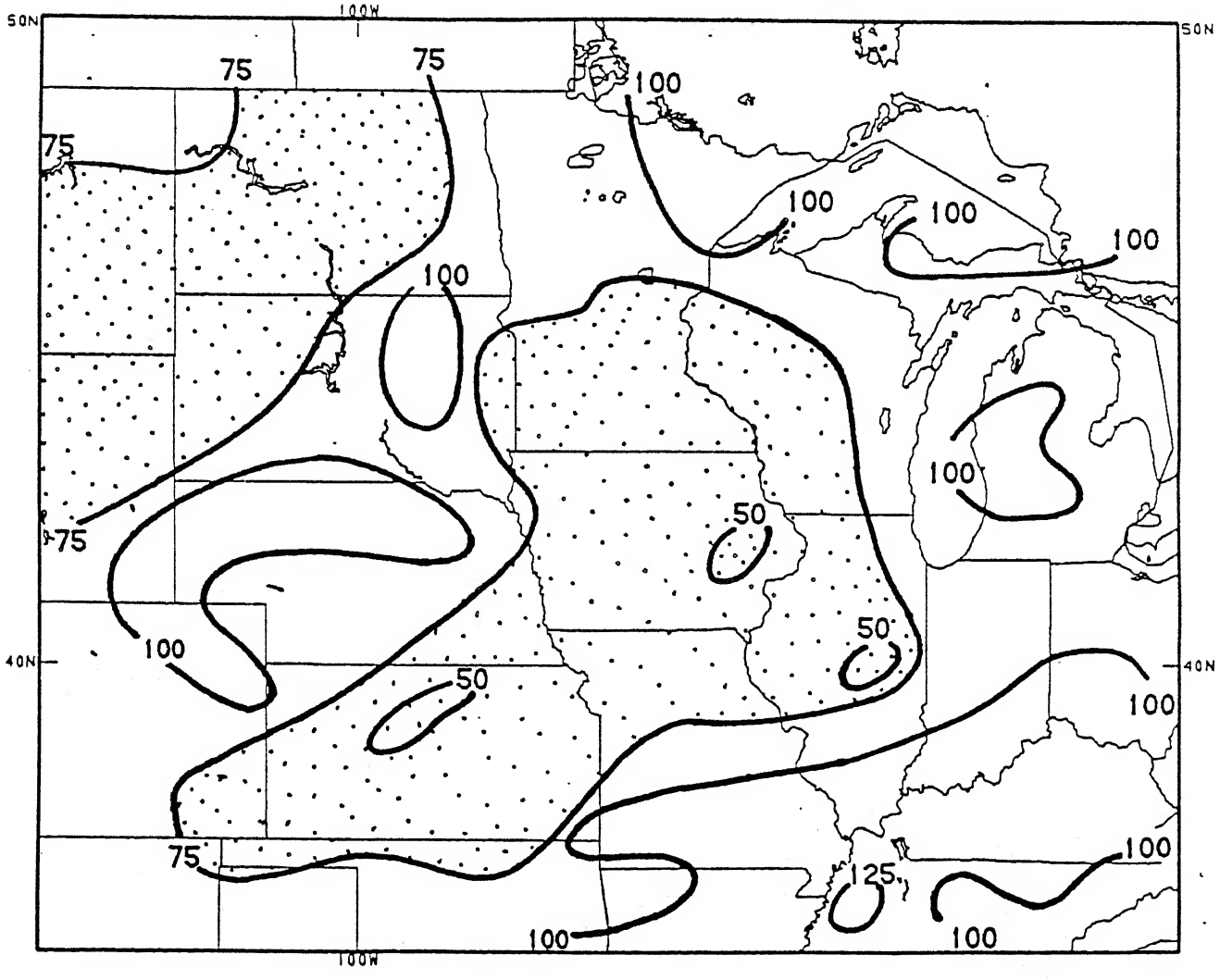


Figure 4. Midwest percent of normal precipitation for the period April 1, 1988 through April 22, 1989. Stippled areas received less than 75% of normal precipitation.